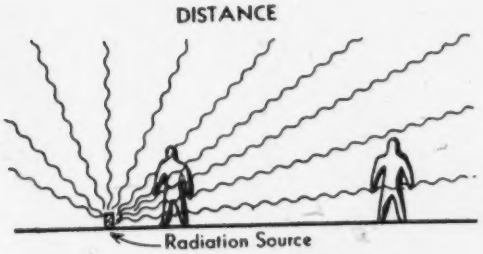
PANEL 10

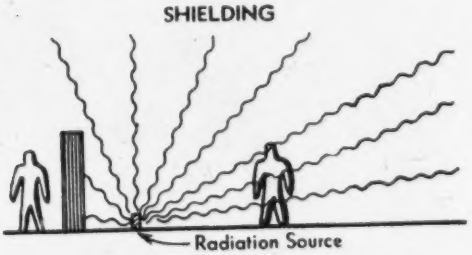
FACTORS AFFECTING RADIATION DOSAGE

DISTANCE



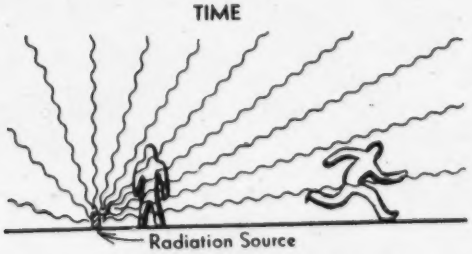
GREATER DISTANCE FROM SOURCE—
LESS RADIATION RECEIVED

SHIELDING



BEHIND SHIELDING FROM SOURCE—
LESS RADIATION RECEIVED

TIME



LESS TIME SPENT NEAR SOURCE—
LESS RADIATION RECEIVED

RADIATION INTENSITY DECAYS WITH TIME

Time after explosion	1 Hour	7 Hours	49 Hours
Radiation Intensity	100 R/hr	10 R/hr	1 R/hr

PANEL 11

THE NATIONAL SHELTER PROGRAM

It should be clear by now that fallout shelters are a major part of the defense of the United States against nuclear attack, and that public community shelters must form the backbone of the shelter system. The National Shelter Program has been the principal means of producing the public fallout shelters needed to provide nationwide protection for most of the population. It has been designed to take into account the lowest cost methods of meeting the requirements for shelter construction. The following paragraphs describe the major elements of this program.

First in emphasis has been the identification of shelter capabilities in existing facilities through the National Fallout Shelter Survey. An analysis of many aspects of shelter needs is included in this survey. The second step is the securing of the signature of facility owners on license agreements to permit the use of acceptable space. These licenses are required before any further action can be taken to prepare the shelter for public use. Following permission by facility owners, the public fallout shelters that meet minimum requirements are marked with standard fallout shelter signs furnished by the Federal Government.

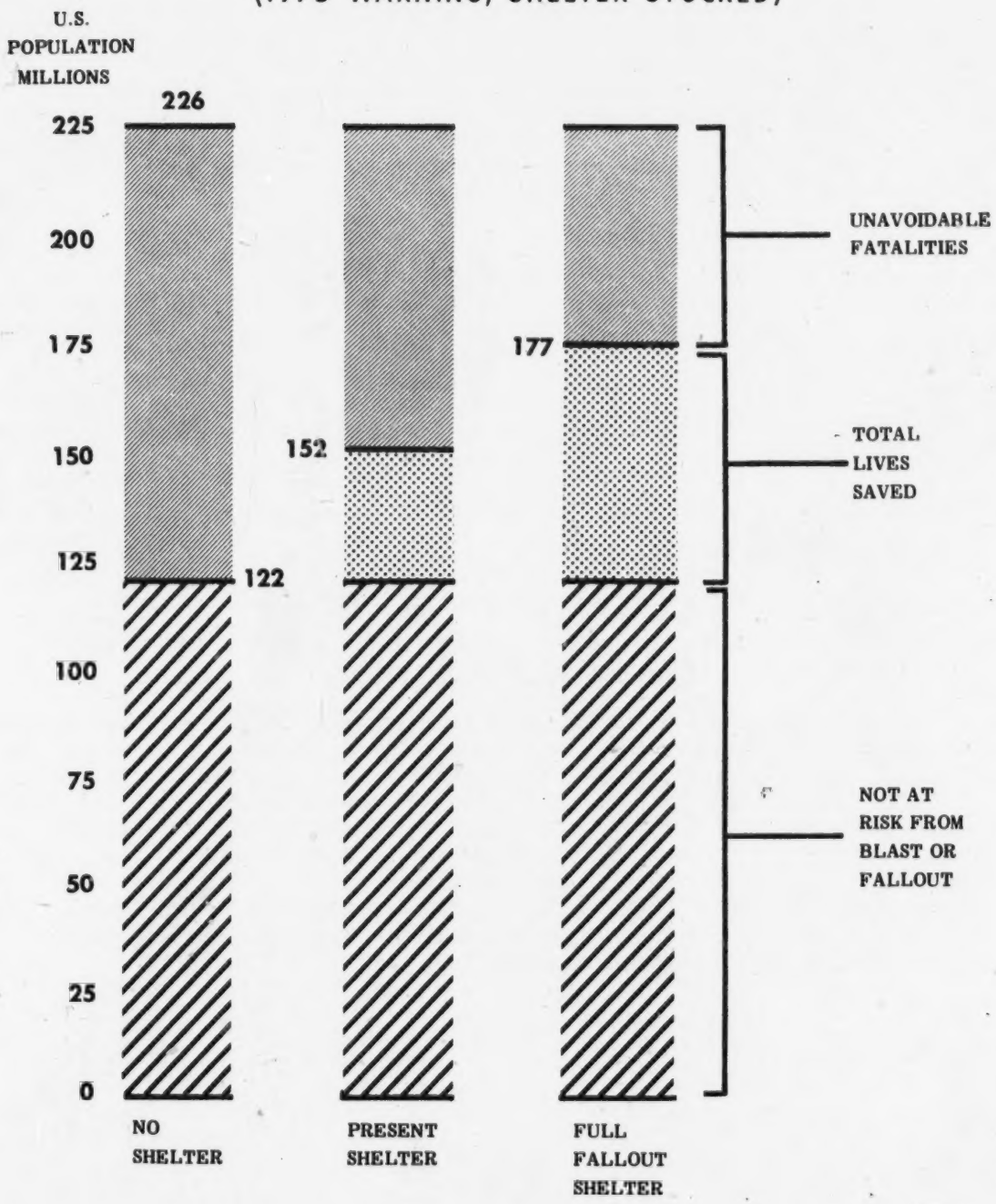
Because of the continuing process of shelter licensing and the construction, remodeling, and demolition of buildings, continuous updating operations are required to keep the nationwide shelter inventory current and, where necessary, to locate additional shelter spaces that have improvable deficiencies. In this way, shelter data is always up-to-date and the number of shelter spaces available comes closer to the ultimate goal of adequate shelter for the total population.

Despite notable progress in identifying public fallout shelter spaces through the nationwide survey, shortages still exist in some areas of the United States, particularly in residential areas. Because of this, individual state Home Fallout Protection Surveys have been conducted for given states upon request of their Governors. The surveys collect data from home occupants on the type of house, materials used in construction, and depth of basement. From these data, the protection factor of the home basement is computed. Then, home occupants are advised of the fallout protection which their homes provide, and if necessary, they are told how to improve the radiation shielding.

PANEL 12

PERFORMANCE OF SHELTER PROGRAMS IN MIXED ATTACK

(1975 WARNING, SHELTER STOCKED)



PANEL 12 (Continued)

LIFESAVING POTENTIAL OF IMPROVED SHELTER DEFENSE

This panel depicts the effectiveness of various shelter defenses in terms of lives saved. If enemy military forces as they will exist in 1975 attacked the United States at that time with nuclear weapons, from 10 percent to 50 percent of the United States population would be destroyed. This assumes a mixed attack with city populations, large industrial installations, and military forces as targets.

No Shelter. In the absence of an effective shelter program for the protection of the population, about 104 million people would become fatalities. This assumes a 1975 population of about 226 million.

Present Shelter. Using the shelter spaces located by the National Fallout Shelter and Home Fallout Protection Surveys, projected to 1975, about 30 million lives could be saved. Adding this 30 million to the 122 million not at risk from blast or fallout would mean 152 million people would survive the attack. This assumes that 10 percent of the people would fail to use available shelters and others would improperly use the shelters (e.g., late entrance and/or early exit).

Full Fallout Shelter. This includes shelters presently available with spaces added by use of packaged ventilation kits, by payments to subsidize shelter in new buildings, and by design "slanting," plus specially constructed fallout shelters as needed to shelter the entire 1975 population. Such shelter would save about 55 million lives, making a total of 177 million people surviving.

Blast Shelter. By including the development of blast shelters in the central cities of the 100 largest metropolitan areas, and blast shelter in the suburban areas surrounding those cities, additional millions of lives could be saved. (This potential is not indicated on the graph.)

CIVIL DEFENSE, U. S. A.

A Programmed Orientation to Civil Defense

TEST

on

UNIT 2 - NUCLEAR WEAPONS EFFECTS AND SHELTERS

INSTRUCTIONS:

Do not look at this test until you have completed Unit 2. When you have completed Unit 2, take this test. Select the one answer for each question which in your opinion is the best answer. Mark the answer on the postcard answer form provided, using a soft lead pencil. Make a heavy mark completely covering the space between the lines of the answer you select. For example, if your answer for the first question were "a," you would mark the answer card as follows:

Please note that your Student Number is on the envelope containing your course materials. BE SURE to enter this Student Number and this Unit Number in the spaces provided on the answer card. When you have marked your answers on the card, mail it to Staff College.

1. A nuclear explosion differs from a conventional explosion in that part of the energy is released as:

   a. thermal radiation.

   b. blast.

   c. nuclear radiation.

   d. firestorm.

2. The two basic types of attack nuclear explosions are:

   a. air and underground (subsurface).

   b. air and ground (surface).

   c. underground and ground.

   d. air and high altitude.

3. The type of nuclear explosion that will produce serious fallout over the greatest area is the:

   a. air burst.

   b. high altitude burst.

   c. surface burst.

   d. subsurface burst.

4. The type of nuclear explosion that will cause the greatest area of destruction by blast and fire is the:

   a. air burst.

   b. underwater burst.

   c. surface burst.

   d. subsurface burst.

5. The claims of "super bombs" with five times the power of existing weapons are:

   a. clearly not true.

   b. partly scare propaganda because the destruction they cause does not increase in direct proportion to their power.

   c. reason enough to abandon the civil defense concept.

   d. proof that an area five times as large will be destroyed.

6. Of the following, select the one that is NOT a characteristic of fallout radiation.

   a. It does damage to biological cells.

   b. It frequently makes exposed objects radioactive.

   c. It decreases with time.

   d. It is very penetrating.

7. If you were exposed to a total dose of 200 R of radiation over three days, you would most likely:

   a. die within a few weeks.

   b. become very ill, but probably survive.

   c. have no severe illness.

   d. have no nausea or other illness.

8. The explosive power of a 10-megaton bomb is equivalent to that of ten:

   a. million tons of TNT.

   b. thousand tons of TNT.

   c. million pounds of TNT.

   d. thousand pounds of TNT.

9. If a can of food was covered with radioactive particles, we would know that the can was contaminated and that the food inside the can was:

   a. not safe to eat due to spoilage.

   b. contaminated and not safe to eat.

   c. exposed to radiation but safe to eat.

   d. destroyed by radiation.

10. If a nuclear explosion produces radioactive fallout over a large area, we assume that the fireball:

   a. was belowground.

   b. was high in the air.

   c. touched the surface of the earth.

   d. was below the surface of water.

11. Radioactive fallout can best be described as:

   a. radiation from the initial bomb burst.

   b. small solid particles that contain radioactive residues from the fireball.

   c. particles of radioactive material which damage everything they touch.

   d. dirt which has been swept up by the bomb blast.

12. During any nuclear attack on the United States, the following is true concerning fallout:

   a. 100% of the country would be covered, but probably only 75% threatened.

   b. 100% of the country would be covered and threatened.

   c. 100% of the country would be threatened, but probably only 75% covered.

   d. 50% of the country would be threatened, but probably only 25% covered.

13. Which of the following bomb bursts would most likely produce the highest amount of radioactive fallout?

a. An air burst over sandy soil.

b. A ground burst on sandy soil.

c. An air burst over rocky ground.

d. A ground burst on rocky ground.

14. All of the following factors, except one, will affect the amount of fallout in a given area. Which one is least important?

a. Size and density of the particles.

b. Wind direction and force.

c. The fact that it is raining or snowing.

d. Speed of the bomb when it burst.

15. The three factors which affect the amount of radiation you would receive from a radioactive source are:

a. the wind direction and force, and the size of the particles.

b. time, distance, and shielding.

c. time, distance from the burst, and size of particles.

d. shielding material, permanent shelter or preplanned, and time.

16. The instrument which is used to measure the total dose of radiation is the:

a. goniometer.

b. survey meter.

c. dosimeter.

d. ammeter.

17. Of the following construction materials, which would provide the greatest amount of protection if used for shelter construction?

a. Concrete.

b. Steel.

c. Earth.

d. Wood.

18. "Slanting" a public building during construction refers to:

a. physically slanting the building to one side so that radioactive particles will be easily washed off.

b. constructing a building so that it may be easily converted to or used as a public fallout shelter.

c. getting the government to provide part of the construction cost of a building if it is to be used as a public shelter.

d. making all entrances and window openings slant.

19. Which of the following would <u>not</u> be a goal of the National Shelter Program?

a. Identifying suitable shelter spaces in public buildings.

b. Marking buildings which contain public shelters.

c. Providing names of people to occupy located shelters.

d. Licensing shelters which have been located.

20. A full fallout shelter program (as would be possible by 1975) could save how many lives in the event of an all out nuclear attack on the United States?

a. Approximately 55 million.

b. Approximately 75 million.

c. Approximately 100 million.

d. Practically everyone in the United States.

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